OIL recovery PROGRAM

Reservoir Class Field Demonstration Program

One of America's most serious energy problems is the premature abandonment of still-productive domestic oil fields.

Already, over half of the crude oil discovered in the United States lies in fields that were abandoned when they became no longer viable economically — and the rate of abandonment is accelerating. As much as 70 percent of the Nation's remaining oil resources could be lost by shortly after the year 2000. The high capital costs of drilling wells and returning pumps, piping, tanks, and other equipment to these fields (and, in some cases, the difficulties of restoring production leases) make it unlikely that abandoned fields will ever be reopened, even if oil prices rise in the future. Unless slowed, the trend to abandonment will lead directly to further job losses and declining oil production.

Increasing Oil Field Productivity

To counter this alarming situation, the Department of Energy has begun the "Reservoir Class Field Demonstration Program," an intensive effort to increase production from U.S. oil fields and prevent them, and the jobs that go with them, from being prematurely abandoned.

Federal Cost-Sharing

The program focuses on the next few critical years. Its thrust is to provide Federal matching funds of up to 50 percent to oil field operators, ranging from small oil companies to major producers, along with other organizations who agree to demonstrate existing or novel advanced technologies that can prolong the economic life of U.S. fields. Many technologies currently available are underused, despite dwindling production levels, and many new advanced processes are becoming available that can dramatically improve the economic productivity of a reservoir.

Buying Time

The demonstration effort is one of the highest priorities in the Federal oil research and development program. If successful, it can "buy time" for many of the Nation's oil field operators, while simultaneously proving that advanced technologies are highly cost-effective in real life situations. In addition to producing more oil today, the technologies provided by this program can help sustain the domestic oil industry well into the 21st century.

WHY PETROLEUM R&D?

- Demand for petroleum continues to rise while oil production declines. Yet two-thirds of the oil found in the United States will remain unrecovered if only conventional production methods are used.
- Already more than half the oil found in the United States has been abandoned. Unless new, lower-cost-per-barrel technology is developed, more domestic fields will be abandoned prematurely.
- Costs for imported oil now amount to more than 60 percent of our trade deficit. Between 1980 and 1992, the United States paid $742 billion (1987 dollars) to other countries to purchase imported crude oil and petroleum products.
- The natural gas and oil industry, including service industries, accounts for nearly 380,000 high-quality American jobs.
- Promising opportunities exist to boost U.S. oil production through improved technology, including advanced computer analysis, techniques to locate bypassed oil, and advanced oil recovery techniques.
- Advanced technology can add 10 to 30 billion barrels to current domestic reserves.

How the Program Is Run

The United States has more than 96,000 oil reservoirs. To determine those that should receive priority attention, DOE first grouped 2,500 of the largest domestic reservoirs into geologically similar "reservoir classes." This represents 65 percent of the oil-in-place in the lower-48 States.

The reservoir classes were then prioritized by:

- the amount of producible oil remaining in them.
- the likelihood of premature abandonment.

Once priorities were set, DOE began running competitions, asking private operators, universities, State agencies, and others to recommend technologies and candidate projects that would increase production from the most threatened of these geologic classes. Three competitions have already been conducted. Subsequent competitions are awaiting congressional funding. Thirty-two projects are already in the program.

Technology Transfer

The theory behind the program is simple: if a technology is successful in one field, it will be successful in a field with similar geology.

Industry partners will spread the success stories. They must help to convey these potential solutions to other producers, and the program encourages partnerships among oil field producers, universities, State agencies, service companies, and consultants to carry out the projects and to conduct related technology transfer efforts. Industry associations such as the Petroleum Technology Transfer Council, and groups of project participants in California and the Permian Basin are also helping to provide detailed, regionally specific technology information to others operators through workshops and field tours.

Reservoir Classes

Class I: Fluvial Dominated Deltaic Sandstones

These reservoirs, one of the first priorities, were formed from ancient river deltas and contain more than 28 billion barrels of crude oil. In April 1992, 14 projects were picked in nine States: Alabama, Colorado, Illinois, Kansas, Louisiana, Oklahoma, Texas, Utah, and Wyoming.

Funding: $48 million in Federal funds; $65 million in private funds.

Class II: Shallow Shelf Carbonates

These reservoirs were formed from shallow ocean shelves now found as far north as the Canadian border, which originally contained more than 68 billion barrels of crude oil. Most of the 48 billion that remain are at risk of being lost forever. In April 1993, 11 projects (two have since dropped out) were selected for matching funds in eight States: Kansas, Michigan, Nebraska, New Mexico, North Dakota, Oklahoma, Texas, and Utah.

Funding: $38 million in Federal funds; $50 million in private funds.

Class III: Slope and Basin

These reservoirs of light and heavy oil were created from the sediment deposited in deep ocean basins, and are estimated to have once contained nearly 60 billion barrels of crude oil; most of the remaining 44 billion are in danger of being abandoned unless more sophisticated techniques are widely deployed. In September 1994, nine projects were selected in California, New Mexico, and Texas.

Funding: $38 million in Federal funds; $50 million in private funds.

Class IV: Strandplain/Barrier Island

These reservoirs were formed from near-shore deposits parallel to ancient shorelines, and have been identified as the next geologic category to be targeted if funding is made available by congress. These reservoirs are known to produce in: Arkansas, California, Colorado, Illinois, Indiana, Kansas, Louisiana, Montana, Nebraska, New Mexico, Oklahoma, Texas, Utah, and Wyoming.

Project Success Stories

As the first group of projects nears completion, increased production is being reported both in the project areas and in nearby properties where other operators have adopted the successful demonstration technologies. For example, 11 production units in the Uinta Basin, northeast Utah, have started or are designing waterfloods based on the demonstration by Lomax Exploration Company (Class 1). These are expected to add 31 million barrels of additional oil production, which could return $160 million in Federal taxes and royalties.

In another project in the Gulf of Mexico, Columbia University in partnership with several universities and oil companies has developed and demonstrated the successful use of 4-D seismic (multiple 3-D seismic surveys conducted several years apart) to locate bypassed reserves, leading to drilling of a well that will return the entire cost of the project in Federal taxes and royalties in 5 years.

For More Information, Contact

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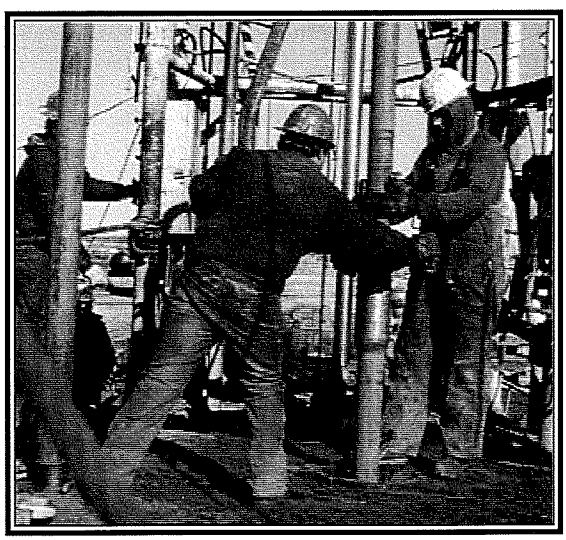
Information is available on the Internet
http://www.bpo.gov



Nearly 380,000 Americans currently work in oil-related industries. Preserving domestic oil field production by using advanced recovery technologies also means preserving jobs.

OIL recovery

PROGRAM

OIL RECOVERY PROJECTS

CLASS I

ANDERMAN/SMITH OPERATING COMPANY
Lamar County, AL

HUGHES EASTERN CORPORATION
Lamar County, AL

DIVERSIFIED OPERATING CORP.
Denver-Julesburg Basin, CO

AMERICAN OIL RECOVERY, INC.
Mattoon Oil Field, IL

UNIVERSITY OF KANSAS CENTER FOR RESEARCH, INC.
Savonburg and Stewart Fields, KS

AMOCO PRODUCTION COMPANY
Cameron Parish, LA

UNIVERSITY OF TULSA
Tulsa County, OK

UNIVERSITY OF OKLAHOMA
Oklahoma FDD Reservoirs

TEXACO EXPLORATION AND PRODUCTION COMPANY
Port Neches Field, TX

UNIVERSITY OF TEXAS AT AUSTIN,
BUREAU OF ECONOMIC GEOLOGY
Vicksburg Fault Zone, TX

LOMAX EXPLORATION COMPANY
Duchesne County, UT

UTAH GEOLOGICAL SURVEY
Bluebell Field, UT

SIERRA ENERGY COMPANY
Park County, WY

COLUMBIA UNIVERSITY
Eugene Island, Block 330 - Federal Outer Continental Shelf, LA

CLASS II

UNIVERSITY OF KANSAS
Jetmore, KS

MICHIGAN TECHNOLOGICAL UNIVERSITY
Crystal Lake, MI

LUFF EXPLORATION COMPANY
Sidney, MT/Bowman, ND

TEXACO EXPLORATION AND PRODUCTION
Hobbs, NM

FINA OIL & CHEMICAL
Seminole, TX

LAGUNA PETROLEUM CORPORATION
Odessa, TX

OXY USA, INC.
Welch, TX

PHILLIPS PETROLEUM COMPANY
Odessa, Tx

UTAH GEOLOGICAL SURVEY
San Juan County, UT

CLASS III

ARCO WESTERN ENERGY
Kern County, CA

CHEVRON PRODUCTION COMPANY
Kern County, CA

CITY OF LONG BEACH, NEAR-TERM
Long Beach, CA

CITY OF LONG BEACH, MID-TERM
Long Beach, CA

PACIFIC OPERATORS OFFSHORE, INC.
Carpinteria Field, Federal Outer Continental Shelf, CA

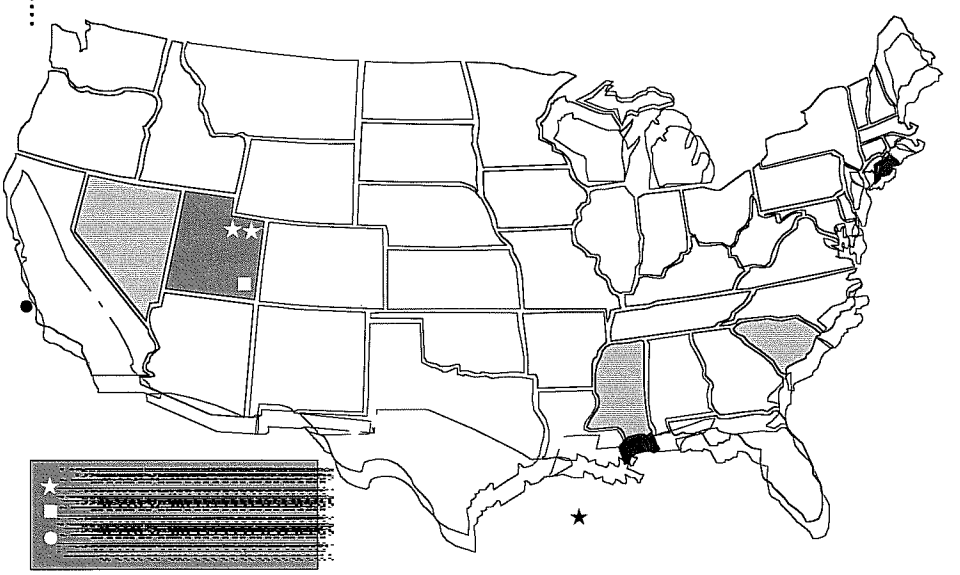
PARKER AND PARSLEY DEVELOPMENT L.P.
Midland County, TX

STRATA PRODUCTION CO.
Eddy County, NM

UNIVERSITY OF TEXAS AT AUSTIN
BUREAU OF ECONOMIC GEOLOGY
Reeves and Culberson Counties, TX

UNIVERSITY OF UTAH
Kern County, CA

THE RESERVOIR CLASS FIELD DEMONSTRATION PROGRAM CURRENTLY INVOLVES PROJECTS IN 14 STATES AND OFFSHORE.



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